Analite NEP-5000 Turbidity Sensor

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The Analite NEP-5000 is a stand-alone turbidity sensor manufactured by Observator Instruments. The NEP-5000 is available in different configurations, including an ISO 7027 version and a backscatter version. The version available from HIF is compliant with ISO 7027-1 with a nephelometric optical configuration and a formazin/StablCal calibration. HIF Stock Item No. 6106040 is available for purchase or rent and comes with a fixed 10-meter cable, stainless steel housing, and stainless guard. HIF Stock Item No. 6106042 is also available for rent or purchase but comes with a fixed 25-meter cable. Both sensors have an infrared light source with a spectral wavelength of 850 nanometers (nm), and a single detector positioned 90 degrees from the light source. The sensor contains a self-cleaning wiper to control biofouling. Communication protocols for the NEP-5000 include digital, RS-422/485, SDI-12, RS-232, universal serial bus (USB), or analog. Each sensor comes supplied with a communication module and a cable for communication and calibration purposes. Beginning in 2019, all ISO-7027 compliant NEP-5000 sensors purchased through the HIF are factory calibrated with formazin and prediluted StablCal standards; and have an operating range of 0.01-4000 FNU. The user has the option of using one of three limited calibration ranges, low (0-100 FNU), medium (101-1000 FNU), or high (1001 – 4000 FNU); or the dynamic auto range of the sensor that will switch to the appropriate calibration range automatically.

To communicate to your sensor, connect the brown (power), green (ground), and grey (data) wires of the cable to the communication module and connect the module to your PC ensuring the communication module is powered with the supplied AC connector. The software may be operated

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Volume 2021, Issue 166

directly through the supplied thumb drive or as an installed program. Before accessing the software, you need to determine the correct com port by using device manager.

Open the software application (NEPOEM file). Click on the green "start" button and select the correct com port. NOTE: This is the com port for the communication module, not the thumb drive. Click on the Tools tab, Calibration, and OEM Calibration Turbidity. A new window will open.


Click "connect" and push the reset button on the communication module. You should see the serial number of the sensor at the bottom of the screen. If you get a failure message, remove the thumb drive, and verify the com port is correct.

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Volume 2021, Issue 166
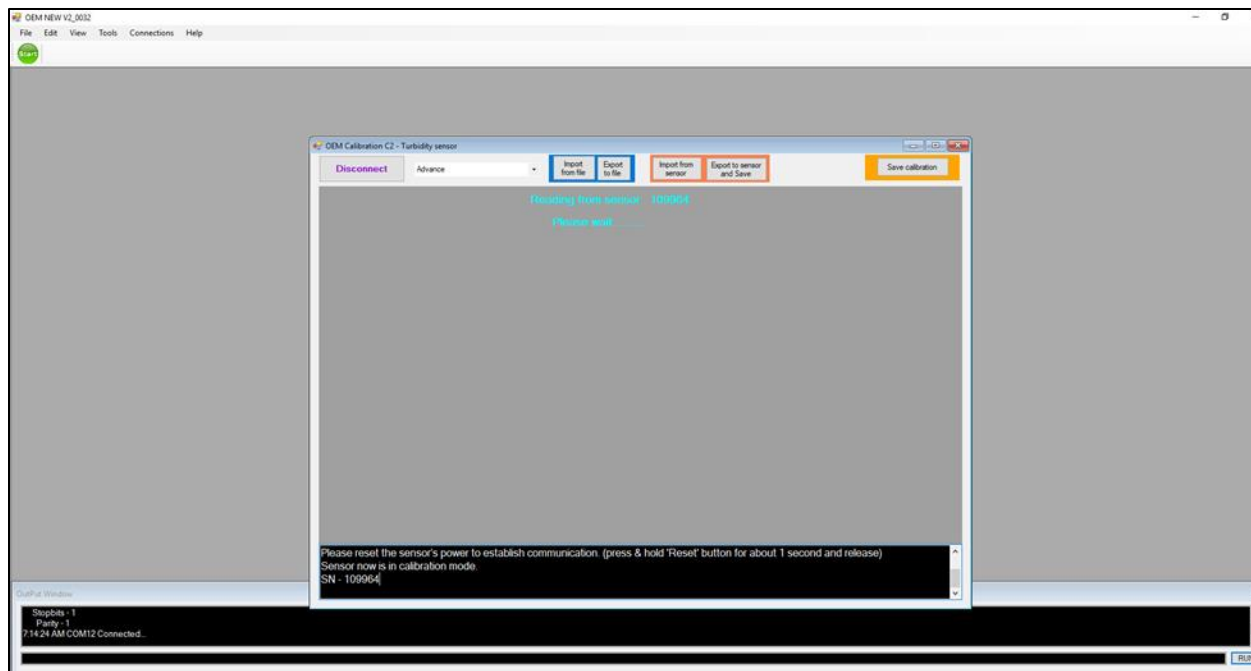
After you establish communication, go to the "sensor stage" tab. Click on the sensor calibrations tab

- Click on "wipe/clean optics" and verify the wiper is operating properly.
- Under Range Calibration, note if "auto" is selected, if not select "auto."
- Verify the sensor accuracy by testing it in a known standard. Click "Get live data."
  HIF recommends testing the NEP-5000 in 18.2 deionized water, and a known standard near your "normal" turbidity. If your measured turbidity is NOT within 5% of the standard value, you should recalibrate.
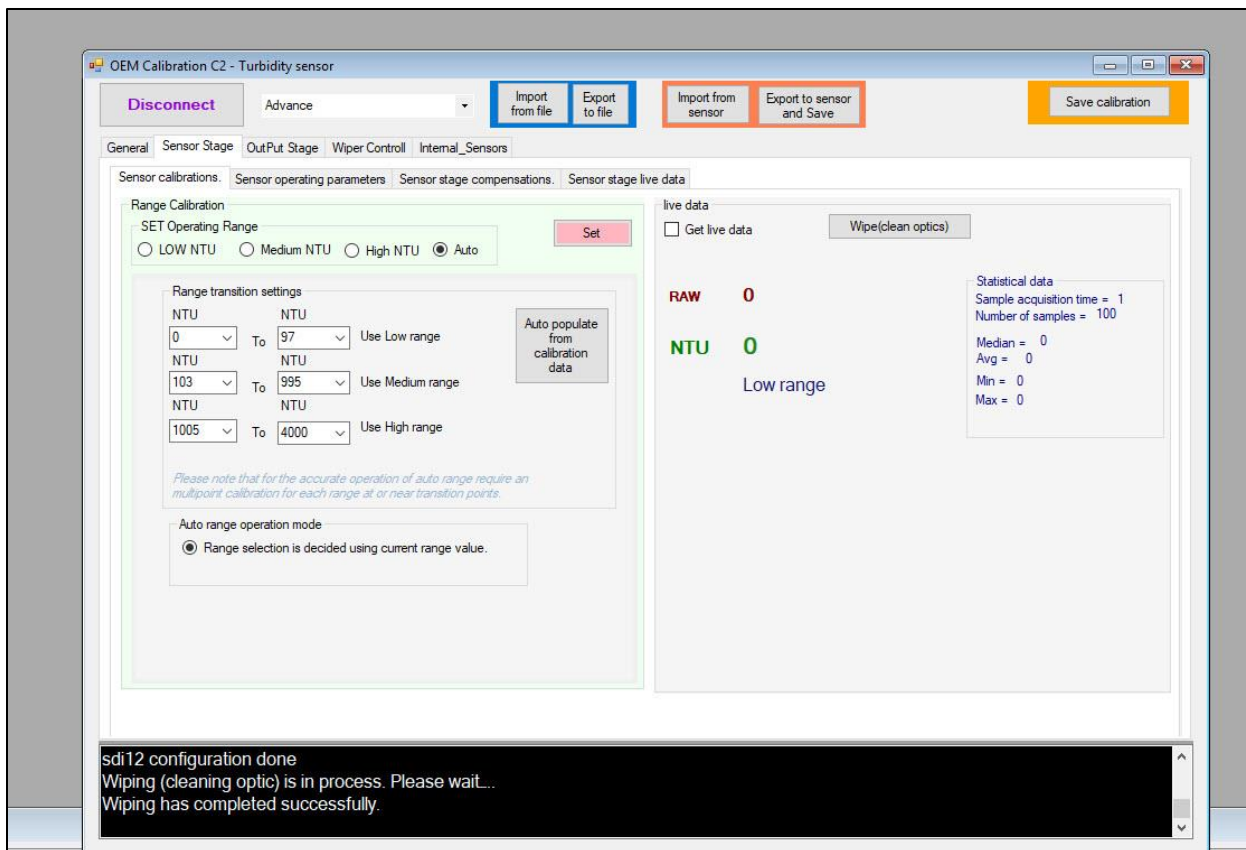
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To recalibrate, you need Type 1 (18.2 Mega-ohm) deionized water, 100 NTU, 1000 NTU, and 4000 NTU StablCal/formazin standards. Verify the accuracy of your standards by using a calibrated benchtop turbidimeter prior to use.

To adjust the sensor calibration:

Click on "Range calibration," and select Low NTU

1. Place the clean sensor optics into ultrapure deionized water (you can use blank water, or it should be at least 18.2 or Type 1). Follow manufacturer guidance on the minimum distance the sensor should be from the sides and bottom of the testing container.
   o Click on "Get live data."
   o If the NTU or RAW values are high, clean the sensor face and repeat
   o Verify 100 NTU is listed in the TopEnd NTU Value for the LOW NTU operating range (in green)
   o Place the sensor into your ultrapure deionized water

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- o Allow the sensor measurements to equilibrate and note the average RAW values and associated NTU. Type in the RAW value for 0 NTU (in red).
- o After collecting the RAW and NTU values, uncheck "get live data."
- o Place the sensor into a resuspended 100 NTU standard – we recommend using StablCal
- o Click on "Get Raw Data," record average RAW values, and NTU. Keep in mind the NTU values are based on the old calibration. Enter the RAW value into the TopEnd NTU box for the LOW range (in red).
- o Click on the "Set" box to save.
2. Click on the Medium NTU range
   - o Verify the value for the 0 NTU raw input box matches the raw value of the DI water in step 1.
   - o Verify 1000 NTU is listed in the TopEnd NTU Value (in green).
   - o Place the sensor into a resuspended 1000 NTU standard. Click on "get Raw Data" and record the average RAW and NTU values.
   - o Enter the RAW value into the TopEnd NTU box for the Medium range (in red).
   - o Uncheck on "Get raw data" and click on the "Set" box to save.
3. Click on the High NTU range
   - o Verify the value for the 0 NTU raw input box matches the raw value of the DI water in step 1.
   - o Verify the upper end of the high range is 4000 NTU (in green).
   - o Place the sensor into a resuspended 4000 NTU standard.
   - o Click "Get live data" and record the average RAW and NTU values.
   - o Enter the average RAW value in the TopEnd NTU (Input RAW) box.
4. Click on "Set."
5. Check Auto Range and "Auto-populate from calibration data."
6. Click "Save calibration" tab in the upper right corner.
7. Click "Export to sensor and Save."

Click the "Sensor operating parameters" tab. In the Statistical Output section, verify the "One sample acquisition time" is set to 10, and the statistical calculation over the number of samples is set to the default of 5. Click the "Set" button to save changes. NOTE: To smooth the data output, the stat calculation sample number can be adjusted up – the higher, the smoother your data.
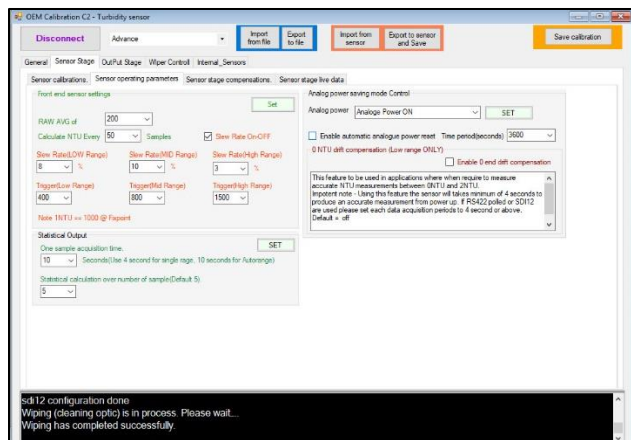
Click on "OutPut Stage" to change the communication mode, and SDI-12 address.
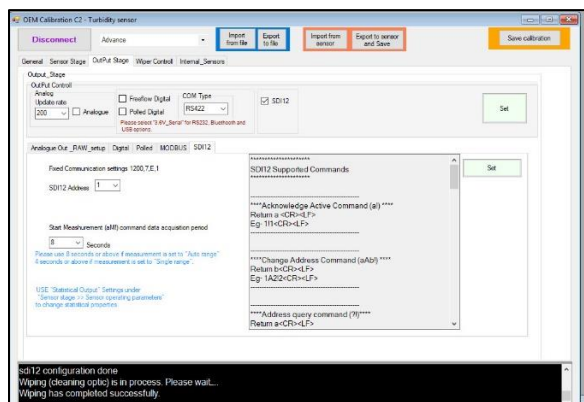
Click on "Wiper Control" to change the wiping mode and other wiping options.

If you have any questions about the Analite NEP-5000, feel free to contact HIF at 800-382-0634.